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Commissioner

# HEALTH HAZARD ALERT

## 1-Bromopropane (n-Propyl Bromide)

**1-Bromopropane (1-BP)** is a new solvent that is effective in dissolving fats, waxes and resins. Two of its main uses are in degreasing agents and in spray adhesives. 1-BP is being used in the furniture industry and as a solvent for adhesives used in constructing foam cushions. The dry cleaning industry, among others, has considered using 1-BP as a replacement for other organic solvents that damage the ozone layer in the upper atmosphere.

The N.C. Department of Labor's Division of Occupational Safety and Health (OSH), is very concerned about the health effects of 1-bromopropane. OSH is issuing this health hazard alert because 1-bromopropane is being considered for widespread use and is not regulated to protect workers, consumers or the environment. North Carolina does not currently have a permissible exposure limit for 1-bromopropane. The American Conference of Governmental Industrial Hygienists recently published a recommended time-weighted average threshold limit value of 10 parts per million, which is equivalent to 50 milligrams of 1-bromopropane (1-BP) per cubic meter of air.[1]

**Hazards:** 1-Bromopropane can harm both the nervous system and the reproductive system. It can damage the nervous system by interfering with nerve conduction, resulting in limb weakness, pain, numbness, and paralysis.[2,3] It can cause reduced fertility and/or sterility in test animals, both male and female, and it can harm the developing fetus in pregnant female test animals. It will soon be tested to find out if it can cause cancer, as many similar chemicals do. Other harmful effects include irritation of the eyes and skin.[4]

### Health Effects

1-Bromopropane enters your body when you breathe its vapor or drops of spray in the air. It can also enter through your skin and cause significant problems, depending on the concentration of 1-BP in the air, your skin contact and exposure time. The toxic effects of 1-bromopropane in humans have not yet been well studied. Because it is a recently introduced chemical, most information comes from animal testing and not from experience with human use. In most of the animal tests, the animals were exposed to 1-bromopropane by breathing it in the air. The following outlines health effects that have been studied.

### Reproductive System

1-Bromopropane damages the reproductive systems in both male and female animals. In males, it damages the sperm, testicles, prostate, epididymis and seminal vesicles and reduces testosterone levels, causing sterility. In females, it damages the ovaries and interferes with the estrous cycle, again causing sterility. 1-Bromopropane also caused delayed growth in the offspring of animals exposed during pregnancy. Some of these effects were seen at exposure levels as low as 200 ppm in the air, and possibly even at 100 ppm. The reproductive toxicity of 1-bromopropane has not been studied in humans, but 2-bromopropane, a closely related chemical, has been found to cause long-lasting ovarian failure and absence of sperm in workers.

### Nervous System

1-Bromopropane damages the nerves in the arms, legs and body. There is evidence that 1-bromopropane may also damage the brain. Animal tests have found these effects with exposures as low as 400 ppm. Case reports show that similar effects can occur in humans.

### Eyes, Nose, Throat and Skin

1-Bromopropane is irritating to the eyes, nose and throat at exposure levels of perhaps 30 ppm. Like other organic solvents, the liquid can dissolve the natural protective oils on skin and cause dermatitis (dry, rough, red, cracked skin).

### Liver

Very high exposures may harm the liver. It is not known whether exposure levels likely to be found in the workplace present any risks to the liver.

### Cancer

1-Bromopropane will soon be tested to see whether it can cause cancer. Many similar chemicals, such as dibromochloropropane, do cause cancer. In some tests, but not in others, 1-bromopropane has caused genetic mutations. Chemicals that cause mutations can often cause cancer as well.

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